

Opportunity Title: High Thrust Density Electrostatic Ion Thruster Development

Opportunity Reference Code: 0025-NPP-NOV23-GRC-AeroEng

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0025-NPP-NOV23-GRC-AeroEng

Application Deadline 11/1/2023 6:00:59 PM Eastern Time Zone

Description Development of high thrust density electrostatic (gridded) ion thrusters is of interest for application to Orbit Transfers (OT) in deep gravity wells as well as for large total impulse high power deep space missions. Ion thrusters for primary propulsion have demonstrated high total impulse, and high specific impulse. However, operation at lower specific impulse (Isp, ;;; 3,000 sec) at high (2:: 5 kW) unit input power (yielding high thrust-to-power) has not been fully investigated. Achieving this would lead to the development of a 'Dual Mode' thruster - a singular design capable of both high Isp operation for on-station operations, while also providing high thrust density, high thrust to-power operation for OT operations.

A variety of research opportunities exist to advance the state-of-art (SOA) in this area. These include:

- Achieving high thrust density by circumventing conventional electrostatic limitations ;
- Increasing thrust-to-power via reduction in thrust losses through unconventional ion optics designs;
- Increasing thrust-to-power via improvements in discharge plasma ion production and containment;
- Increasing thrust density via unconventional discharge chamber designs; and
- Development and demonstration of carbon-based ion optics, yielding order-of-magnitude increases in lifetime over SOA.

Location:

Glenn Research Center
Cleveland, Ohio

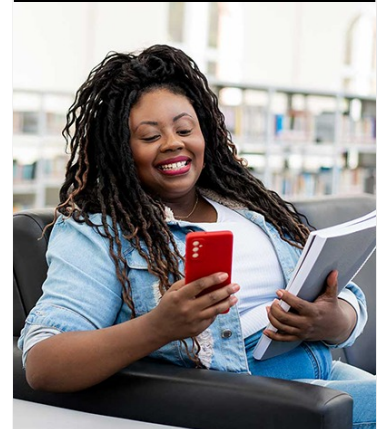
Field of Science: Aeronautics, Aeronautical or Other Engineering

Advisors:

Michael Patterson
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216-977-7481

Eligibility is currently open to:

- U.S. Citizens;
- U.S. Lawful Permanent Residents (LPR);
- Foreign Nationals eligible for an Exchange Visitor J-1 visa status; and,
- Applicants for LPR, asylees, or refugees in the U.S. at the time of application with 1) a valid EAD card and 2) I-485 or I-589 forms in pending status



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Eligibility Requirements • **Degree:** Doctoral Degree.